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Final Results from the Qweak Experiment: A Search for New Physics via a Measurement of the Proton's Weak Charge

Thursday, 14 June 2018 14:00 (30 minutes)

The Qweak experiment precisely measures the proton's weak charge using parity-violating elastic electron scattering from the proton at Jefferson Laboratory. The Standard Model makes a firm prediction for the proton's weak charge, thus providing a sensitive test for new physics beyond the Standard Model. This talk will cover the measurement methodology, key technical challenges, and the most significant aspects of the data analysis. Final results for the proton's weak charge and resulting extracted values of the weak mixing angle and vector weak quark couplings will be presented along with the implications for new beyond-the-Standard-Model physics. This work was supported by DOE Contract No. DEAC05-06OR23177, under which Jefferson Science Associates, LLC operates Thomas Jefferson National Accelerator Facility. Construction and operating funding for the experiment was provided through the U.S. Department of Energy (DOE), the Natural Sciences and Engineering Research Council of Canada (NSERC), and the National Science Foundation (NSF) with university matching contributions from the College of William and Mary, Virginia Tech, George Washington University, and Louisiana Tech University.

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